

Page 8, line 1, change "comprising" to --including--;
line 3, change "comprising" to --having--;
line 10, change "comprising a first area including" to --including a first area
having--;
line 12, change "comprising" to --having--;
line 24, change "comprising" to --including--;
line 26, change "comprising" to --including--.

Page 9, line 1, after "information" insert --,--;
line 4, after "modifying" insert --the--;
line 14, change "comprising" to --including--;
line 16, change "comprising" to --having--.

IN THE CLAIMS:

Please **AMEND** claims 1-4, 7-11, 14-20, 23-26, 28-34, 36-39, 41-43, 45-48 as follows. The remaining claims are reprinted, as a convenience to the Examiner, as they presently stand before the U.S. Patent and Trademark Office.

21

1. (ONCE AMENDED) A method [for generating] to generate additional information [for guaranteeing] to guarantee seamless playback, the method comprising [a step of] generating data stream information for each of two or more data streams [comprising] having packet data to which information on an arrival time of the respective packet data is added, the data stream information [comprising] including seamless playback information, which indicates whether a corresponding data stream is to be seamlessly reproduced after playback of a preceding data stream, and/or seamless time control information [for controlling] to control an output time of the corresponding data stream to be seamlessly reproduced.

2. (ONCE AMENDED) The method of claim 1, wherein the seamless time control information [comprises] includes a reference time, offset information and/or gap length information.

3. (ONCE AMENDED) The method of claim 2, [wherein] further comprising obtaining the reference time [is obtained] based on arrival times of packet data of the preceding data stream and [indicates] indicative of an output time of a first packet data of the corresponding data stream to be seamlessly reproduced.

4. (ONCE AMENDED) The method of claim 2, wherein the offset information is obtained based on arrival times of packet data of the preceding data stream and is a value of [the] a difference between an original arrival time of a first packet of the corresponding data stream to be seamlessly reproduced and [the] an output time of the first packet of the corresponding data stream.

5. (NOT AMENDED) The method of claim 2, wherein the gap length information is a value of an amount of time from an output time of a last packet of the preceding data stream to a time at which a first packet of the corresponding data stream to be seamlessly reproduced must be output.

6. (NOT AMENDED) The method of claim 1, wherein the seamless time control information is valid only when the seamless information has a value indicating "seamless playback."

7. (ONCE AMENDED) The method of claim 1, wherein each of the data streams [comprises] includes a plurality of packs, each pack [which comprises] including the [predetermined number of] packet data to which information on the arrival time of the respective packet data is added, and an extra header which is added to the packet data with arrival time information.

8. (ONCE AMENDED) A recording medium comprising:
a first area including a plurality of data streams [composed of] including packet data to which information on the arrival time of the respective packet data is added; and
a second area including data stream information [comprising] including seamless information, which indicates whether a corresponding data stream is to be seamlessly reproduced after playback of a preceding data stream, and/or seamless time control information [for controlling] to control an output time of the corresponding data stream to be seamlessly reproduced.

9. (ONCE AMENDED) The recording medium of claim 8, wherein the seamless time control information [comprises] includes a reference time, offset information and/or gap length information.

10. (ONCE AMENDED) The recording medium of claim 9, wherein the reference time is [obtained] based on arrival times of packet data of the preceding data stream and indicates an output time of a first packet data of the corresponding data stream to be seamlessly reproduced.

11. (ONCE AMENDED) The recording medium of claim 9, wherein the offset information is [obtained] based on arrival times of packet data of the preceding data stream and is a value of [the] a difference between an original arrival time of a first packet of the corresponding data stream to be seamlessly reproduced and [the] an output time of the first packet of the corresponding data stream.

12. (NOT AMENDED) The recording medium of claim 9, wherein the gap length information is a value of an amount of time from an output time of a last packet of the preceding data stream to a time at which a first packet of the corresponding data stream to be seamlessly reproduced must be output.

13. (NOT AMENDED) The recording medium of claim 8, wherein the seamless time control information is valid only when the seamless information has a value indicating "seamless playback."

14. (ONCE AMENDED) The recording medium of claim 8, wherein each of the data streams in the first area [comprises] includes a plurality of packs, each pack [which comprises] including the [predetermined number of] packet data to which information on the arrival time of the respective packet data is added, and an extra header which is added to the packet data with the arrival time information.

15. (ONCE AMENDED) A recording apparatus, comprising:
an arrival time information generator [for adding] to add arrival time information on an arrival time of input packet data to each input packet data;
a data stream information generator [for generating] to generate data stream information for each of two or more data streams [comprising] including the packet data to which the arrival time information of the respective packet data is added, the data stream information [comprising] including seamless playback information, which indicates whether a corresponding data stream is to be seamlessly reproduced after playback of a preceding data stream, and/or seamless time control information [for controlling] to control an output time of the corresponding data stream to be seamlessly reproduced; and
a recording controller [for performing] to perform control such that the data streams are [stream is] recorded in a first area of a recording medium and the data stream information is recorded in a second area of the recording medium.

16. (ONCE AMENDED) The recording apparatus of claim 15, wherein each of the data streams in the first area comprises a plurality of packs, each pack [which comprises] includes the [predetermined number of] packet data to which information on the arrival time of the respective packet data is added, and an extra header which is added to the packet data with the arrival time information.

17. (ONCE AMENDED) The recording apparatus of claim 15, further comprising a counter which is driven by a system clock signal and reset at [the] a moment when a first packet of each data stream is input, [for performing] the counter performing a counting operation and providing a count value to the arrival time information generator.

18. (ONCE AMENDED) The recording apparatus of claim 15, wherein the seamless time control information [comprises] includes a reference time, offset information and/or gap length information.

19. (ONCE AMENDED) The recording apparatus of claim 18, wherein the reference time is [obtained] based on arrival times of packet data of the preceding data stream and indicates an output time of a first packet data of the corresponding data stream to be seamlessly reproduced.

20. (ONCE AMENDED) The recording apparatus of claim 18, wherein the offset information is [obtained] based on arrival times of packet data of the preceding data stream and is a value of [the] a difference between an original arrival time of a first packet of the corresponding data stream to be seamlessly reproduced and [the] an output time of the first packet of the corresponding data stream.

21. (NOT AMENDED) The recording apparatus of claim 18, wherein the gap length information is a value of an amount of time from an output time of a last packet of the preceding data stream to a time at which a first packet of the corresponding data stream to be seamlessly reproduced must be output.

22. (NOT AMENDED) The recording apparatus of claim 18, wherein the seamless time control information is valid only when the seamless information has a value indicating "seamless playback."

23. (ONCE AMENDED) An editing apparatus [for editing] to edit data recorded in a recording medium, having [comprising] a first area including a plurality of data streams [composed of] including packet data to which information on the arrival time of the respective packet data is added[;], and a second area including data stream information [comprising] having seamless information, which indicates whether a corresponding data stream is to be seamlessly reproduced after playback of a preceding data stream, and/or seamless time control information [for controlling] to control an output time of the corresponding data stream to be seamlessly reproduced, the editing apparatus comprising:

84
a data information updator [for] to analyze and update, after an editing of the plurality of data streams [by the editing apparatus], [analyzing] the data stream information [and] by updating the seamless time control information so that data at either side of [the] a boundary between data streams, at which seamless playback is not guaranteed, [can be] is seamlessly [played back] playbackable; and

an editing controller [for performing] to perform control such that the edited plurality of data streams are recorded in a first area of the recording medium and the updated data stream information is recorded in a second area of the recording medium.

24. (ONCE AMENDED) The editing apparatus of claim 23, wherein the seamless time control information [comprises] includes a reference time, offset information and/or gap length information.

25. (ONCE AMENDED) The editing apparatus of claim 24, wherein the reference time is [obtained] based on arrival times of packet data of the preceding data stream and indicates an output time of a first packet data of the corresponding data stream to be seamlessly reproduced.

1A4 26. (ONCE AMENDED) The editing apparatus of claim 24, wherein the offset information is [obtained] based on arrival times of packet data of the preceding data stream and is a value of [the] a difference between an original arrival time of a first packet of the corresponding data stream to be seamlessly reproduced and [the] an output time of the first packet of the corresponding data stream.

27. (NOT AMENDED) The editing apparatus of claim 24, wherein the gap length information is a value of an amount of time from an output time of a last packet of the preceding data stream to a time at which a first packet of the corresponding data stream to be seamlessly reproduced must be output.

28. (ONCE AMENDED) The editing apparatus of claim 23, wherein each of the data streams in the first area [comprises] includes a plurality of packs, each pack [which comprises] including the [predetermined number of] packet data to which information on the arrival time of the respective packet data is added, and an extra header which is added to the packet data with the arrival time information.

AS 29. (ONCE AMENDED) A playback apparatus for reproducing data recorded in a recording medium [comprising] having a first area including a plurality of data streams [composed of] including packet data to which information on [the] an original arrival time of the respective packet data is added[;], and a second area including data stream information [comprising] having seamless information, which indicates whether a corresponding data stream is to be seamlessly reproduced after playback of a preceding data stream, and/or seamless time control information [for controlling] to control an output time of the corresponding data stream to be seamlessly reproduced, the playback apparatus comprising:

a playback controller [for reproducing] to reproduce the data streams and data stream information which are recorded in the recording medium;

a counter which is driven by a system clock signal and reset according to original arrival time information which has been added to a packet that is first reproduced by the playback controller;

a first processor [for modifying] to modify original arrival time information of a corresponding data stream to be seamlessly reproduced so as to provide modified arrival time information, or [for providing] to provide a control signal indicating a time when the counter is to be reset, based on the data stream information provided from the playback controller; and

AS a second processor [for controlling] to control output of the data streams by removing the original arrival time information which is added to the packet data in the corresponding data stream, which is provided from the playback controller, in response to [an] the output of the first processor.

30. (ONCE AMENDED) The playback apparatus of claim 29, wherein,

when reproducing the corresponding data stream to be seamlessly reproduced without a reset of the counter, the second processor [controls output by removing] removes the original arrival time information when the modified arrival time information is identical to the original arrival time information which has been added to the packet data, and[,]

when reproducing the corresponding data stream to be seamlessly reproduced with the reset of the counter, the second processor [controls output by resetting] resets the counter to a value of the original arrival time information of a first packet data of the corresponding data stream in response to the control signal and [removing] removes the original arrival time information when the output of the counter is identical to the original arrival time information which is added to the packet data.

31. (ONCE AMENDED) The playback apparatus of claim 29, wherein each of the data streams in the first area [comprises] includes a plurality of packs, each pack [which comprises] including the [predetermined number of] packet data to which information on the arrival time of the respective packet data is added, and an extra header which is added to the packet data with the original arrival time information.

32. (ONCE AMENDED) The playback apparatus of claim 29, wherein the seamless time control information [comprises] includes a reference time, offset information and/or gap length information.

33. (ONCE AMENDED) The playback apparatus of claim 32, wherein the first processor converts the original arrival time information of [the] a first packet data of the corresponding data stream into the reference time and adds a value of the offset information to values of the original arrival time information of the [rest] remaining packet data of the corresponding data stream to provide the modified arrival time information.

34. (ONCE AMENDED) The playback apparatus of claim 32, wherein the first processor adds a value of the offset information to a value of the arrival time information of a first packet of the corresponding data stream and, thereafter, adds the value of the offset information to values of the original arrival time information of the [other] remaining packet data of the corresponding data stream to provide the modified arrival time information.

35. (NOT AMENDED) The playback apparatus of claim 32, wherein the first processor adds a value of the gap length information to a value of the original arrival time information of a last packet data of the preceding data stream to provide the control signal indicating the time when the counter is to be reset.

36. (ONCE AMENDED) The playback apparatus of claim 32, wherein the second processor ignores the [referent] reference time, offset information and/or gap length information and outputs the data [stream] streams recorded in the first area of the recording medium based on the original arrival time information, when the seamless information has a value indicating "non-seamless playback."

37. (ONCE AMENDED) A recording and playback apparatus comprising:

an arrival time information generator [for adding] to add original arrival time information on an original arrival time of input packet data to [each] a plurality of respective input packet data;

a data stream information generator [for generating] to generate data stream information for each of two or more data streams [comprising] including the packet data to which the original arrival time information of the respective packet data is added, the data stream information [comprising] having seamless playback information, which indicates whether a corresponding data stream is to be seamlessly reproduced after playback of a preceding data stream, and/or seamless time control information [for controlling] to control an output time of the corresponding data stream to be seamlessly reproduced;

a recording controller [for performing] to perform control such that the data [stream is] streams are recorded in a first area of a recording medium and the data stream information is recorded in a second area of the recording medium;

a playback controller [for reproducing] to reproduce the data streams and data stream information which are recorded [in] on the recording medium;

a counter which is driven by a system clock signal, the counter being reset at the moment when each data stream is input, [and] the counter performing a counting operation to provide a count value to the arrival time information generator, during recording, the counter

being reset according to the original arrival time information which is added to a packet which is first reproduced by the playback controller, during playback;

a first processor [for modifying] to modify an original arrival time information of a corresponding data stream to be seamlessly reproduced so as to provide modified arrival time information, or [for providing] to provide a control signal indicating a time when the counter is to be reset, based on the data stream information provided from the playback controller; and

Alp a second processor [for controlling] to control output of the data streams by removing the original arrival time information which is added to the packet data in the corresponding data stream, which is provided from the playback controller, in response to [an] the output of the first processor.

38. (ONCE AMENDED) The recording and playback apparatus of claim 37, wherein,

when reproducing the corresponding data stream to be seamlessly reproduced without reset of the counter, the second processor [controls output by removing] removes the original arrival time information when the modified arrival time information is identical to the original arrival time information which has been added to the packet data, and[,]

when reproducing the corresponding data stream to be seamlessly reproduced with the reset of the counter, the second processor [controls output by resetting] resets the counter to a value of the original arrival time information of a first packet data of the corresponding data stream in response to the control signal and [removing] removes the original arrival time information when the output of the counter is identical to the original arrival time information which is added to the packet data.

46
39. (ONCE AMENDED) The recording and playback apparatus of claim 37, wherein each of the data streams in the first area [comprises] includes a plurality of packs, each pack which [comprises] includes the predetermined number of packet data to which information on the original arrival time of the respective packet data is added, and an extra header which is added to the packet data with the original arrival time information.

40. (NOT AMENDED) ~~The recording and playback apparatus of claim 37, wherein the seamless time control information is valid only when the seamless information has a value indicating "seamless playback."~~

41. (ONCE AMENDED) The recording and playback apparatus of claim 37, wherein the seamless time control information [comprises] includes a reference time, offset information and/or gap length information.

47
42. (ONCE AMENDED) The recording and playback apparatus of claim 41, wherein the reference time is [obtained] based on original arrival times of packet data of the preceding data stream and indicates an output time of a first packet data of the corresponding data stream to be seamlessly reproduced.

43. (ONCE AMENDED) The recording and playback apparatus of claim 41, wherein the offset information is [obtained] based on original arrival times of packet data of the preceding data stream and is a value of [the] a difference between an original arrival time of a first packet of the corresponding data stream to be seamlessly reproduced and [the] an output time of the first packet of the corresponding data stream.

44. (NOT AMENDED) The recording and playback apparatus of claim 41, wherein the gap length information is a value of an amount of time from an output time of a last packet of the preceding data stream to a time at which a first packet of the corresponding data stream to be seamlessly reproduced must be output.

45. (ONCE AMENDED) The recording and playback apparatus of claim 41, wherein the first processor converts the original arrival time information of [the] a first packet data of the corresponding data stream into the reference time and adds a value of the offset information to values of the original arrival time information of the [rest] remaining packet data of the corresponding data stream to provide the modified arrival time information.

AS 46. (ONCE AMENDED) The recording and playback apparatus of claim 41, wherein the first processor adds a value of the offset information to a value of the arrival time information of a first packet of the corresponding data stream and, thereafter, adds the value of the offset information to values of the original arrival time information of the [other] remaining packet data of the corresponding data stream to provide the modified arrival time information.

47. (ONCE AMENDED) The recording and playback apparatus of claim 41, wherein the first processor adds a value of the gap length information to a value of [the] original arrival time information of a last packet data of the preceding data stream to provide the control signal indicating the time when the counter is to be reset.

48. (ONCE AMENDED) The recording and playback apparatus of claim 41, wherein the second processor ignores the [referent] reference time, offset information and/or gap length information and outputs the data [stream] streams recorded in the first area of the

AG recording medium based on the original arrival time information, when the seamless information has a value indicating "non-seamless playback."

Please ADD new claims 49-69

AG 49. (NEW) A method to guarantee seamless playback of data streams, comprising:
generating data stream information for each of two or more data streams, each data stream having packet data including information on an arrival time of the respective packet data, the data stream information including seamless playback information that indicates whether a respective data stream is to be seamlessly played back; and

generating seamless playback of the two or more data streams, based on the corresponding seamless playback information and/or seamless time control information for controlling an output time of the corresponding data stream to be seamlessly reproduced.

50. (NEW) The method of claim 49, wherein the seamless time control information includes a reference time, offset information and/or gap length information.

51. (NEW) The method of claim 50, further comprising obtaining the reference time based on arrival times of packet data of the preceding data stream and indicative of an output time of a first packet data of the corresponding data stream to be seamlessly reproduced.

52. (NEW) The method of claim 50, wherein the offset information is obtained based on arrival times of packet data of a preceding data stream and is a value of a difference between an original arrival time of a first packet of the corresponding data stream to be seamlessly reproduced and an output time of the first packet of the corresponding data stream.

53. (NEW) The method of claim 50, wherein the gap length information is a value of an amount of time from an output time of a last packet of a preceding data stream to a time at which a first packet of the corresponding data stream to be seamlessly reproduced must be output.

54. (NEW) A recording apparatus to record at least two or more data streams to a recording medium, each data stream including packed data to which an arrival time information of the respective packed data has been added, comprising:

a data stream information generator to generate data stream information for each of the two or more data streams, the data stream information including seamless playback information, which indicates whether a corresponding data stream is to be seamlessly reproduced after playback of a preceding data stream, and/or seamless time control information to control an output time of the corresponding data stream to be seamlessly reproduced; and

a recording controller to record the two or more data streams in a first area of a recording medium and the data stream information in a second area of the recording medium.

55. (NEW) The recording apparatus of claim 54, wherein each of the data streams in the first area of the recording medium includes a plurality of packs, each pack having the packet data to which information on the arrival time of the respective packet data has been added, and an extra header which is added to the packet data with corresponding arrival time information.

56. (NEW) The recording apparatus of claim 54, further comprising a counter which is reset at a moment when a first packet of each data stream is input, the counter performing a counting operation and providing a count value to an arrival time information

generator, the arrival time information generator adding the arrival time added to each packet of the data streams.

57. (NEW) The recording apparatus of claim 54, wherein the seamless time control information includes a reference time, offset information and/or gap length information.

58. (NEW) The recording apparatus of claim 57, wherein the reference time is based on arrival times of packet data of the preceding data stream and indicates an output time of a first packet data of the corresponding data stream to be seamlessly reproduced.

59. (NEW) The recording apparatus of claim 57, wherein the offset information is based on arrival times of packet data of the preceding data stream and is a value of a difference between an original arrival time of a first packet of the corresponding data stream to be seamlessly reproduced and an output time of the first packet of the corresponding data stream.

60. (NEW) The recording apparatus of claim 57, wherein the gap length information is a value of an amount of time from an output time of a last packet of the preceding data stream to a time at which a first packet of the corresponding data stream to be seamlessly reproduced must be output.

61. (NEW) An editing apparatus to edit data streams, each data stream including packet data to which information on the arrival time of the respective packet data has been added, comprising:

a data information updater to analyze and update, after an editing of the data streams, a data stream information by updating a seamless time control information, the seamless time control information being included in the data stream information and used to control an output

time of the corresponding data stream to be seamlessly reproduced, so that data at either side of a boundary between data streams, at which seamless playback is not guaranteed, is seamlessly playbackable; and

an editing controller to record the edited data streams in a first area of the recording medium and the updated data stream information in a second area of the recording medium.

62. (NEW) The editing apparatus of claim 61, wherein the seamless time control information includes a reference time, offset information and/or gap length information.

63. (NEW) The editing apparatus of claim 62, wherein the reference time is based on arrival times of packet data of a preceding data stream and indicates an output time of a first packet data of a corresponding data stream to be seamlessly reproduced.

64. (NEW) The editing apparatus of claim 62, wherein the offset information is based on arrival times of packet data of a preceding data stream and is a value of a difference between an original arrival time of a first packet of a corresponding data stream to be seamlessly reproduced and an output time of the first packet of the corresponding data stream.

65. (NEW) The editing apparatus of claim 62, wherein the gap length information is a value of an amount of time from an output time of a last packet of a preceding data stream to a time at which a first packet of a corresponding data stream to be seamlessly reproduced must be output.

66. (NEW) A playback apparatus for reproducing data streams, each data stream including packet data to which information on an original arrival time of the respective packet data has been added, comprising:

a playback controller to reproduce the data streams and a data stream information, the data stream information including seamless time control information to control an output time of the corresponding data stream to be seamlessly reproduced;

66. a counter which is reset according to an original arrival time information of a packet of a data stream that is first reproduced by the playback controller;

66. a first processor to modify original arrival time information of a corresponding data stream to be seamlessly reproduced so as to provide modified arrival time information, or to provide a control signal indicating a time when the counter is to be reset, based on the data stream information provided from the playback controller; and

66. a second processor to control output of the data streams by removing the original arrival time information which has been added to the packet data in the corresponding data stream, which is provided from the playback controller, in response to the output of the first processor.

67. (NEW) The playback apparatus of claim 66, wherein,

when reproducing the corresponding data stream to be seamlessly reproduced without a reset of the counter, the second processor removes the original arrival time information when the modified arrival time information is identical to the original arrival time information which, and

when reproducing the corresponding data stream to be seamlessly reproduced with the reset of the counter, the second processor resets the counter to a value of the original arrival time information of a first packet data of the corresponding data stream in response to the

control signal and removes the original arrival time information when the output of the counter is identical to the original arrival time information.

AG 68. (NEW) The playback apparatus of claim 66, wherein each of the data streams includes a plurality of packs, each pack including the packet data and an extra header which is added to the packet data with the original arrival time information.

69. (NEW) The playback apparatus of claim 66, wherein the seamless time control information includes a reference time, offset information and/or gap length information.
